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ABSTRACT

The significance of family background (FB) and school factors (SO) in predicting differences among students in their achievement and motivation in different regions of the country (North-South) and areas of residence (metropolitan-nonmetropolitan) is investigated. A statistical test of the equality of slopes and intercepts was used for the FB and SO sets combined to determine group differences, and commonality analyses were conducted and compared for the different groups to determine the relative roles of FB and SO. Analyses showed that Expectations for Excellence, Educational Plans, and Study Habits were more fully explained by FB and SO in the South than in the North, except at grade 12 where the North or the metropolitan North becomes more predictable. Attitude Toward Life and Achievement were more predictable in the South than North from FB and SO for all grade levels. Family background plays a more significant role in the development of achievement and motivation than do the school factors, and is generally more influential in the North than in the South for all dependent variables except Educational Plans. School factors are slightly more influential in the South, as are the common portions, which may represent mutual interplay of FB and SO. These results suggest that independently of an individual student's own family background, the achievement and motivational levels of his fellow students influence his achievement and motivation. See TM 000 144 and TM 000 145. (PB)

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OFFICE OF PROGRAM PLANNING AND EVALUATION

MEMORANDUM

TO : Technical Paper Recipients

FROM: George W. Mayeske
Office of Program Planning and Evaluation

SUBJ: Technical Paper Number 8: Variations in Achievement and Motivation by Family Background, School Factors and Geographic Location

This paper presents the results of analyses of variations in Achievement and Motivation by Family Background, School Factors and Geographic Location (non-metropolitan North, metropolitan North, non-metropolitan South and metropolitan South). The data came from the Educational Opportunities Survey. Although not in final form this paper will in time become Chapter 8.0 of a larger report focusing on the student and different aspects of his background. This paper is circulated now in order to solicit reactions to its mode of presentation. A summary is given on the last several pages.

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OFFICE OF PROGRAM PLANNING AND EVALUATION

Division of Elementary and Secondary Programs

Variations in Achievement and motivation by Family Background, School Factors and Geographic Location

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8.0 Variations in Achievement and Motivation by Family Background, School Factors and Geographic Location

In the previous chapter it was hypothesized that because conditions of social well being and child rearing practices differ in different parts of the country, family influences on achievement and motivation might be found to vary as well. Quite pronounced differences in family influences were observed for some of the achievement and motivation measures by region of the country (North, South) and area of residence (metropolitan, non-metropolitan). This chapter examines variations in possible school influences for these same groups. The definition of these groups is the same as in the previous chapter.

The specific questions being addressed in this chapter are: (1) "To what extent are the differences among students in their motivation and achievement more fully explained (or more predictable) by school factors for some of these groups (non-metropolitan North, metropolitan North, non-metropolitan South, metropolitan South) than for others?" and (2) "To what extent do the relative roles of school factors and family background factors differ for these different groups?"

To answer the first question, the same framework for testing the equality of slopes and intercepts that was used in the previous chapter was also used in this chapter. To answer the second question commonality analyses of the relative roles of family background and school factors were compared for the different groups.

For almost all analyses the F statistic for the slopes and intercept was 2 or greater and the traditional significance levels were surpassed (except at the third grade). Those groups that were not statistically different were retained in order to enable a comparison of grade level trends. To represent the student's Family Background the set of three Social Background (SB) variables and four Family Process* (PRCS) variables, a set of seven variables in all, was used. These two sets combined will hereafter be called Family Background (FB). Some discussion is necessary however, of the rationale for the selection of a set of school factors.

Analyses of school factors in Chapter 5 used a set consisting of: (i) three Student Body Social Background variables, (ii) a comprehensive set of thirty-one School variables representing different aspects of the school's staff, facilities and policies and, (iii) a set of five School Outcome (SO) variables. In all a set of thirty-nine variables was used to represent different aspects of the school and student body. Another seven variables were used to represent the individual students Social Background (SB) and Family Process (PRCS). In total then, analyses entailing a set of forty-six variables were used in Chapter 5. When examining subgroup differences, however, the number of schools in each group will be much less than the total and would often times not support regression analyses based upon forty-six variables. Computational problems (linear dependences) as well as unstable and even erratic results might occur if analyses with a large number of

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*The SB set is comprised of the students Socio-Economic Status, Family Structure and Racial-Ethnic Group Membership. When Achievement is the dependent variable the PRCS set is comprised of Expectations, Attitude Toward Life, Educational Plans and Desires, and Study Habits; when Expectations is the dependent variable the PRCS set contains Achievement plus the three other attitudinal variables (see Chapter 3).

variables are based on a small number of observations. In order to circumvent this problem certain properties of this particular data analysis model (as outlined in Chapter 2) were exploited. It may be recalled from discussions in chapters 2, 5 and 6 that the maximum amount of variance in an individual student variable, such as Achievement, that can be explained from a combination of school variables is given by the squared correlation of that variable with its school mean counterpart. Since this correlation is a maximum value no amount of other school variables can increase or surpass this value. It is appropriate then to study the behavior of this school variable that yields a maximum value, in conjunction with family background variables, as an upper bound to what the relationships might be if a larger number of school variables had been used. A concrete example may help to clarify this point. Suppose we want to study the role of school variables in individual Achievement but we do not have enough observations to support analysis with a large number of variables. In lieu of other school variables we can use school Achievement (the school mean) since it is the one school variable that is maximally correlated with individual achievement across schools. When this variable is used in conjunction with family background variables the magnitude of the unique role that is attributed to the school will be equal to or greater than the magnitude of the unique role that would have been obtained for the school had say, thirty other school variables been used in lieu of this one variable. By way of illustration Table 8.0 compares the unique and common portions at the ninth grade when a set of only five school variables (including the school mean counterpart of the

dependent variable) is used instead of thirty-nine school variables.* Inspection of Table 8.0 shows that when the set of thirty-nine school variables (F) is replaced by a subset of five of its variables (R) the commonality coefficients are identical within rounding error. The explanation for this apparent parodox is that the SO set contains the variable that is maximally correlated with the dependent variable. When other variables are entered into the regression with this maximum variable they will contribute essentially no information since the maximum value has already been attained. We can get a better appreciation of this phenomenon by comparing the squared multiple correlations for the F and R sets of SCHOOL variables in Table 8.0 (viz.,R-SQUARE(Xi) for F and R under the SCHOOL column). These values are essentially the same and hence their difference is zero. Thus no additional information is contributed by variables other than the maximum variable, which is the school mean counterpart of the dependent variable and is contained in the SO set. It would be appropriate therefore, to use only the SO set to represent the many different aspects of the school. The use of this set would not bias the results either for or against school and family background influences. Accordingly, the SO set will be used to represent the school in this chapter and those following chapters that inquire into possible school influences.

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*The full set (F) in Table 8.0 contains the thirty-nine school variables designated SBSB, SCHL, and SO in Chapter 5. The reduced set (R) is merely the SO set comprised of the school means for Expectations, Attitude Toward Life, Educational Plans, Study Habits and Achievement, also described in Chapter 5.

Table 8.0. - Comparative Commonality Analyses With A Full Set (F) and a Reduced Set (R) of School Variables for the Ninth Grade

	EXPECTATIONS				ATTITUDE				ED. PLANS			
	FB *		SCHOOL*		FB		SCHOOL		FB		SCHOOL	
	F*	R*	F	R	F	R	F	R	F	R	F	R
U(Xi)	39	39	2	2	27	27	5	5	43	43	2	2
C(X1X2)	4	4	4	4	12	12	12	12	7	7	7	7
R-SQUARE(Xi)	43	43	6	6	39	39	17	17	50	50	9	9
R SQ(X1X2)	45	45	45	45	44	44	44	44	52	52	52	52

	STUDY HABITS				ACHIEVEMENT			
	FB		SCHOOL		FB		SCHOOL	
	F	R	F	R	F	R	F	R
U(Xi)	39	38	2	2	25	25	6	5
C(X1X2)	8	8	8	8	22	22	22	22
R-SQUARE(Xi)	47	46	10	10	47	47	28	27
R SQ(X1X2)	49	48	49	48	53	52	53	52

*FB (an abbreviation for Family Background) represents the combined set of Family Social Background and Process variables (7 variables in all); SCHOOL indicates the set of variables representing the school; F indicates the full set of 39 variables while R indicates the 5 variables that are a reduced set, a subset of the 39.

The same subgroups as were used in the previous chapter were also used in this chapter. Since the analytic routine did not allow for a test of interaction between the different modes of classification, marginal totals are also presented to help determine what the extent of this interaction might be. The number of students was given in the previous chapter and the number of schools is given below for each subgroup and grade level.

		Non-Metropolitan	Metropolitan	Total
North	12	149	158	307
	9	160	249	409
	6	420	813	1233
	3	452	855	1307
	1	243	433	676
South	12	388	85	473
	9	411	103	514
	6	884	253	1137
	3	895	251	1146
	1	488	138	626
Total	12	537	243	780
	9	571	352	923
	6	1304	1066	2370
	3	1347	1106	2453
	1	731	571	1302

The remainder of this chapter is organized by sections around each dependent variable. Within each section the predictability (squared multiple correlation) of the School Outcome (SO) set is compared over the grade levels for each subgroup as are the squared multiple correlations for the combined SO and FB set. For the commonality analyses this latter set, FB is used to represent the students total family background while the SO set is used to represent the many different aspects of the school. "Unitized" commonality analyses are presented and discussed for the ninth grade (where the indices are best measured but most of the dropouts have not yet occurred). This "unitizing" operation is conducted in order to make the subgroup differences more comparable and is performed by dividing the commonality coefficients by the squared multiple correlation obtained for both sets of variables (viz., FB and SO). Next grade level trends (using "unitized" commonalities) are compared to see to what extent the results at the ninth grade are modified at the other grade levels. Grade level trends must be interpreted with caution since the indices are better measured at the higher (9 and 12) than at the lower (3 and 6) grade levels. Analyses are not presented for the first grade since a set of Family Process (PRCS) measures was not available. Trends from the ninth to twelfth grade can be interpreted with more certainty since the indices are the same at these grades. Many of the differences at these grades (9 and 12) represent the loss of the less well motivated, lower achieving students who drop out of school.

8.1 Variations in Family Background and School Factors for Expectations for Excellence by Geographic Location

Figure 8.1.1 presents a graphical comparison of the squared multiple correlations for the set of School Outcome measures (SO) both alone and in combination with the Family Background (FB) set of variables. Inspection of Figure 8.1.1 shows that Expectations is **uniformly** more predictable from SO in the South than in the North. This figure also shows that there is a progressive decline for the SO value at the higher grade levels especially in the South. When the FB set is entered into the analysis with SO a marked increase in the value of the squared multiple correlations is observed. The trend observed now is similar to the results in the previous chapter in that the South tends to be more predictable than the North until the twelfth grade when the North becomes more predictable. The values tend also to increase at the higher grade levels for all the subgroups.

Table 8.1.1 compares unitized commonality analyses for these subgroups.

Table 8.1.1. - Unitized Commonality Analyses of Family Background and School Factors For Expectations for Excellence by Geographic Location: Ninth Grade Students

	Non-Metropolitan			Metropolitan			Total		
	Unique		Common	Unique		Common	Unique		Common
Region	FB	SO		FB	SO		FB	SO	
North	87	5	8	89	2	9	89	4	7
South	82	4	14	85	4	11	83	4	13
Total	83	7	10	87	4	9	87	4	9

Figure 8.1.1. - Percent of Variation in Expectations for Excellence Accounted for by Family Background and School Factors by Geographic Location

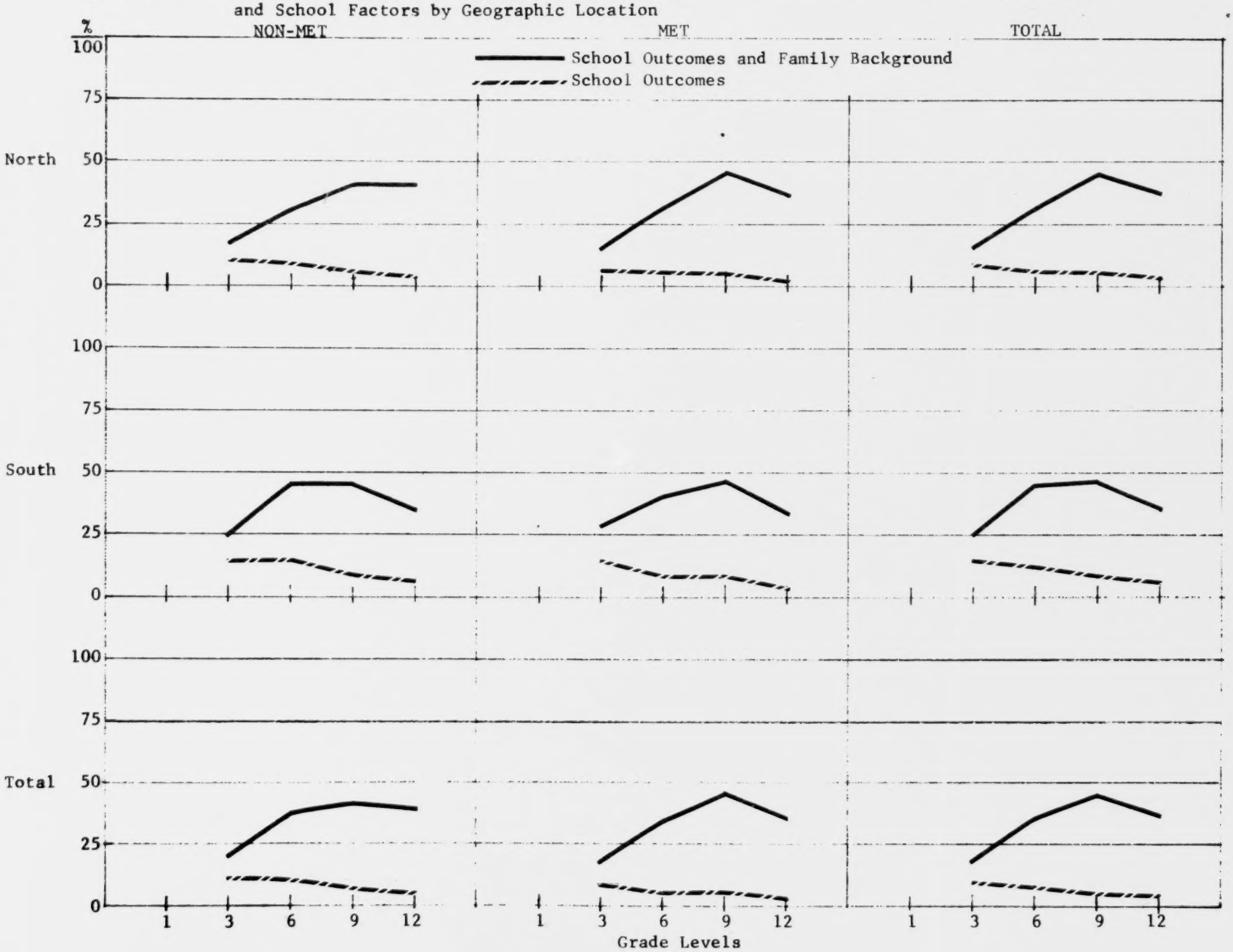
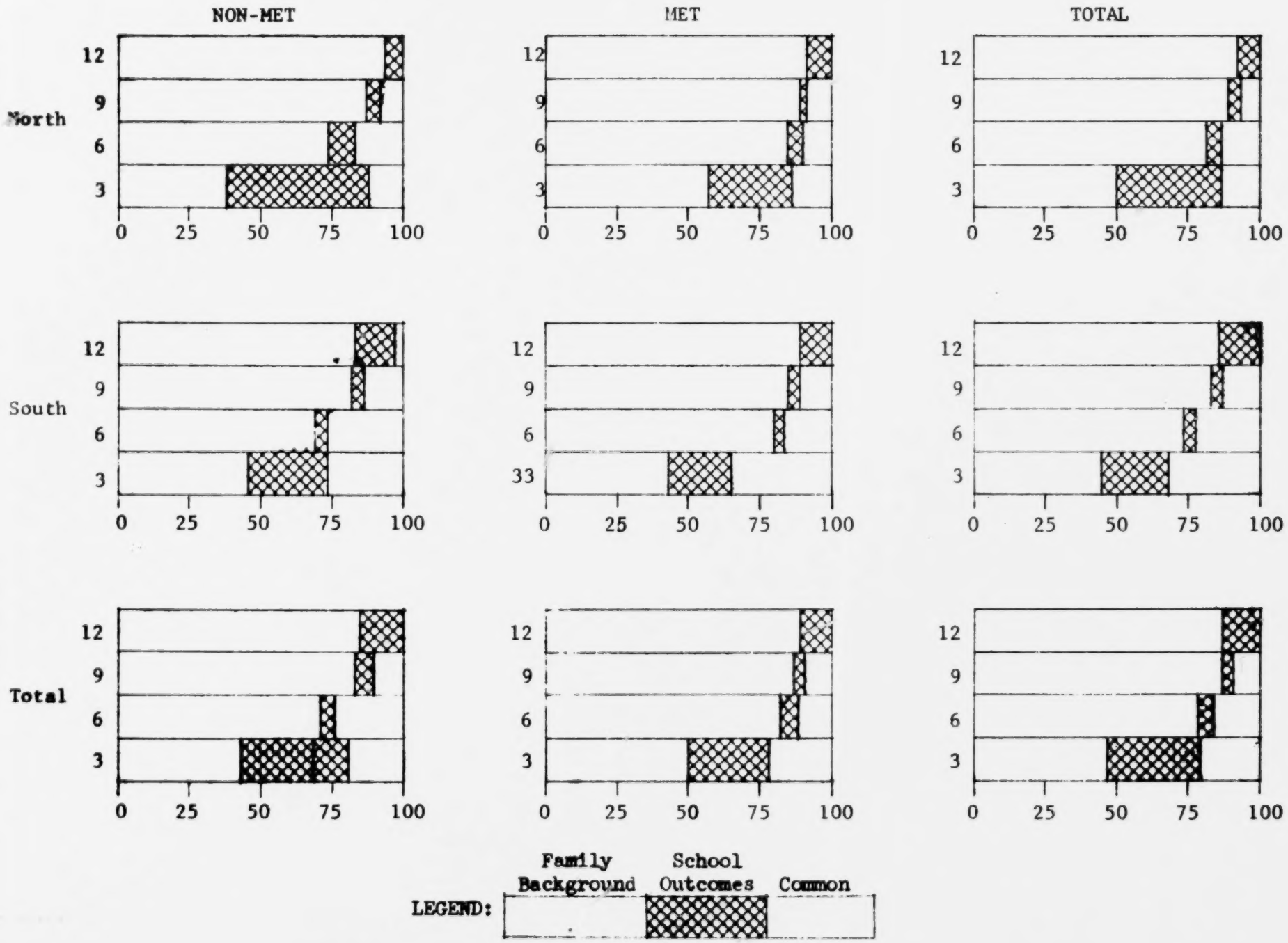


Table 8.1.1 shows that the percent of Expectations uniquely attributable to SO is slightly smaller in the metropolitan (met) North than in the other groups. The unique values for these latter groups tend to be close together in magnitude. The percent uniquely attributable to FB is greater in the North than the South (particularly the met North). These results suggest that the relative roles of FB and SO differ somewhat, although not greatly, from North to South and from met to non-met.

Figure 8.1.2 compares these results with those from the other grade levels. This figure shows that the unique percent attributable to FB increases at the higher grade levels, somewhat more so in the North than in the South,while the unique role for SO declines through the ninth grade to increase again at the twelfth grade. This increase at the twelfth grade is somewhat greater in the South than in the North. The common portions decrease at the higher grade levels dropping to zero for most of them at the twelfth grade.

In summary this section has shown that for Expectations, the South is more predictable than the North from a set of School Outcome (SO) measures. When this SO set is combined with a set of Family Background (FB) measures the South is still more predictable, until the twelfth grade when the North becomes more predictable. Unitized commonality analyses at the ninth grade showed that the relative roles of FB and SO differed somewhat although not greatly, from North to South and from met to non-met. The values for FB were dramatically greater than for SO, sometimes by as much as 22 to 1. Examination of grade level trends showed that the unique value for FB increased at the higher grade levels (particularly in the North) while the unique value for SO decreased through the ninth grade to increase again at the twelfth

Figure 8.1.2. - Unitized Commonality Analyses of Family Background and School Factors by Geographic Location and Grade Level for Expectations for Excellence



particularly in the South. Evidently Southern schools play a greater role at the higher grade levels in the development of Expectations than do Northern schools.

8.2 Variations in Family Background and School Factors for Attitude Towards Life by Geographic Location

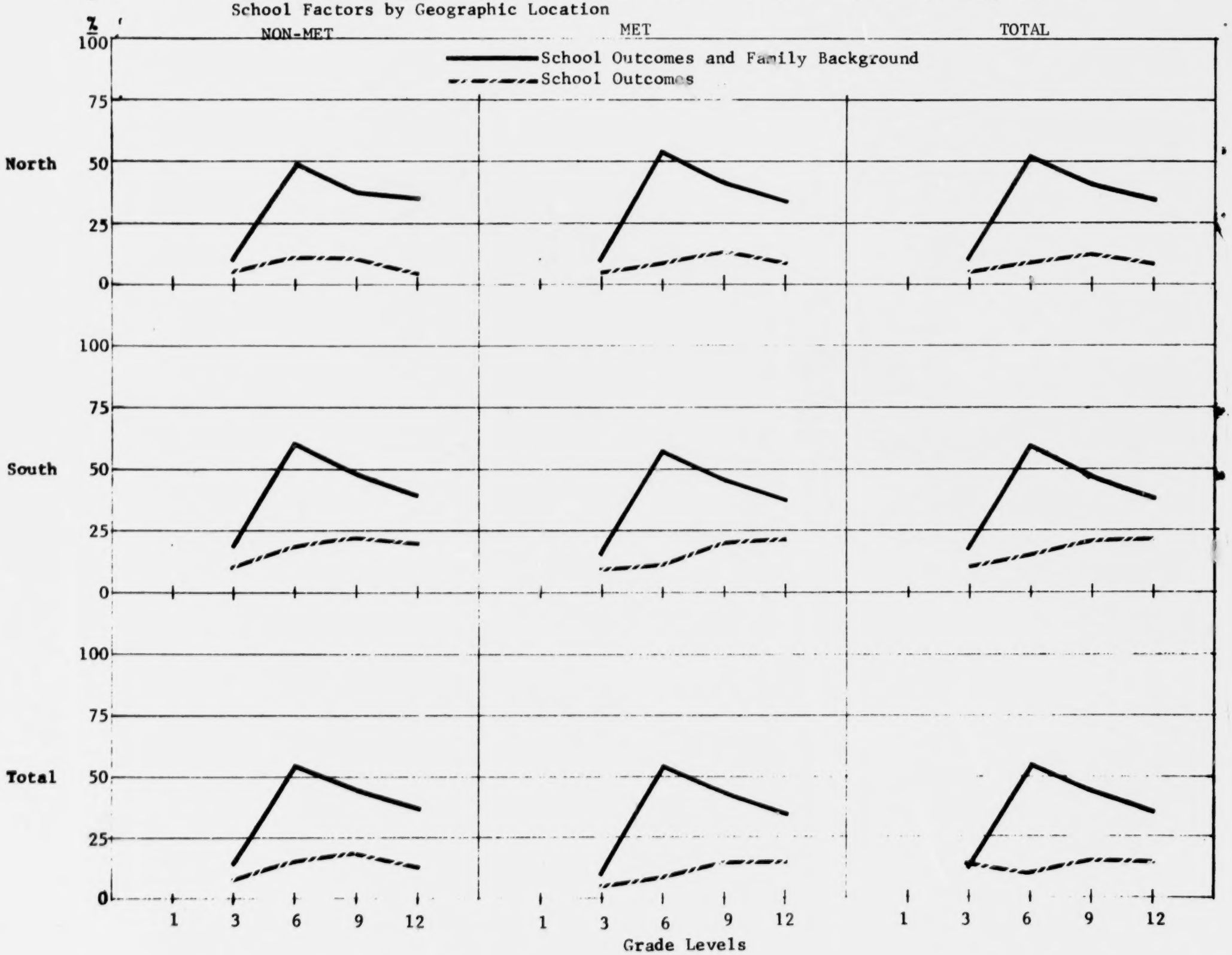
Figure 8.2.1 presents the squared multiple correlations for SO and FB for Attitude Towards Life. For SO, we can observe that the South is uniformly more predictable than the North particularly at the higher grade levels. When FB is brought into the analysis with SO there is a substantial increase in the level of predictability, however, the South remains more predictable than the North. Unlike Expectations, Attitude Towards Life remains more predictable in the South than in the North at the twelfth grade. In the previous chapter when only students were entered into the analysis a North-South reversal in the level of predictability was observed for the twelfth grade. Evidently when school differences are entered into the analysis they alter this result. Later sections show that this occurs for some of the other variables as well.

Table 8.2.1 presents unitized commonality analyses of Attitude Towards Life for the ninth grade.

Table 8.2.1. - Unitized Commonality Analyses of Family Background and School Factors for Attitude Towards Life by Geographic Location: Ninth Grade Students

	Non-Metropolitan			Metropolitan			Total		
	Unique		Common	Unique		Common	Unique		Common
Region	FB	SO		FB	SO		FB	SO	
North	73	11	16	69	7	24	71	7	22
South	53	14	33	58	13	29	55	15	30
Total	59	14	27	65	9	26	61	12	27

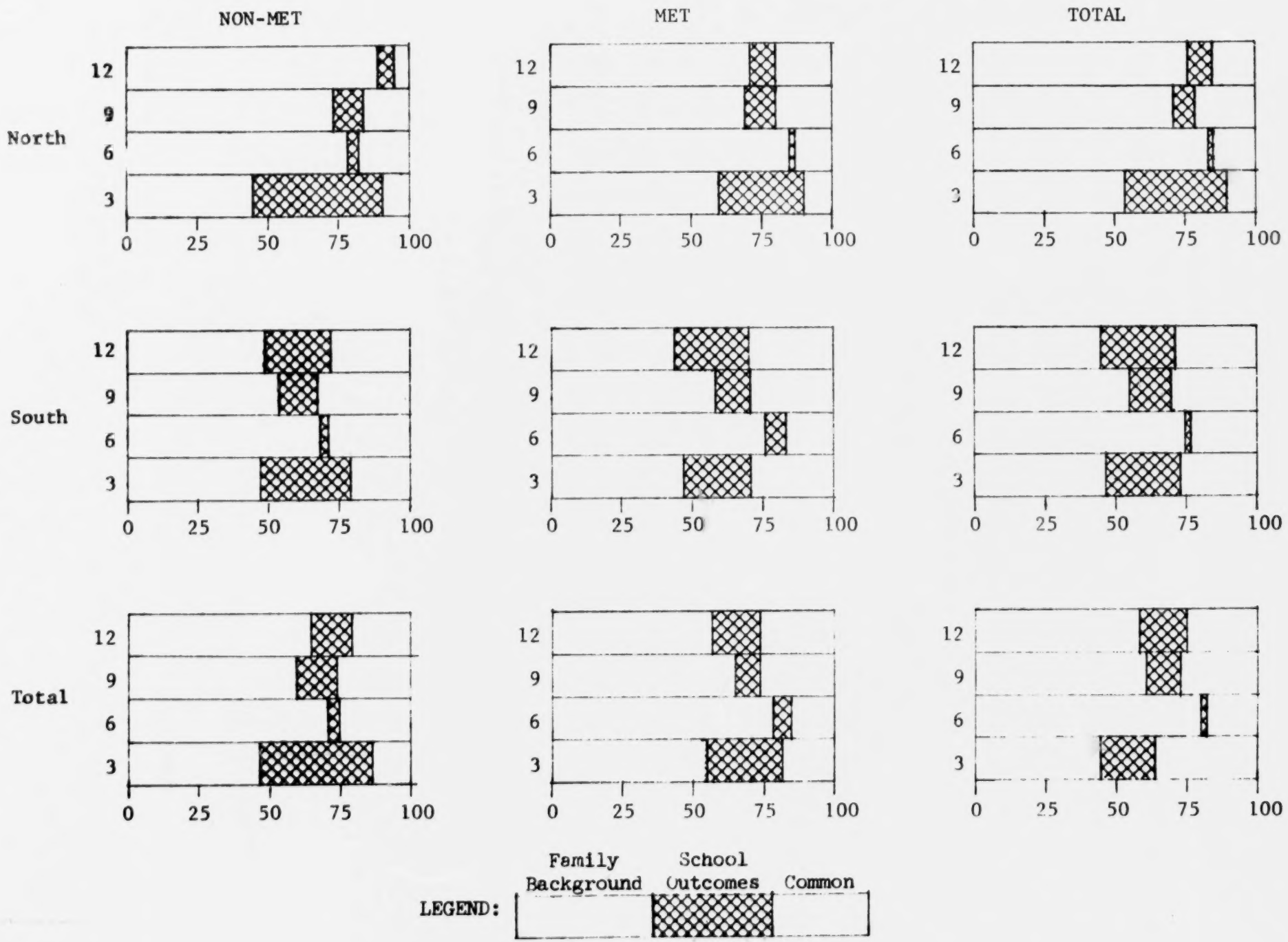
Figure 8.2.1. - Percent of Variation in Attitude Towards Life Accounted for by Family Background and School Factors by Geographic Location



Inspection of Table 8.2.1 shows that there are marked North-South differences in the relative roles of FB and SO as well as met-non-met differences. The most pronounced difference is for the unique role of family background (FB) to be greater than that of the school (SO) in the North than in the South, sometimes by as much as 10 to 1. These differences are somewhat more pronounced in the met than in non-met areas for both North and South. The magnitude of the common portions are also worthy of note since they often substantially exceed the unique value for the school (SO). These common portions are larger in the South than in the North and suggest a greater confounding or interplay of school and family influences in the South than in the North.

Figure 8.2.2.compares results at other grade levels with those at the ninth grade. Inspection of these grade level trends shows even more marked subgroup differences than those observed for the ninth grade. Results at the third grade are least consistent in absolute value with the other grade levels; however, in their relative roles, the unique value for family background (FB) does tend to be greater than that for the school (SO). In the non-met North the unique role of FB increases at the twelfth grade while that for SO (as well as the common portion) decreases. In the met North the unique value for FB drops after the sixth grade while the unique value for SO and the common portion increases. For the South (both met and non-met) a different picture emerges with the unique values for FB decreasing from the sixth grade on while those for SO increase. The common portions stay about the same from the sixth grade on but increase in the met South. Thus, in the North, the unique role of family background is much greater and the unique role of the school (SO) is much less than in the South (primarily at grades nine and twelve).

Fighre 8.2.2. - Unitized Commonality Analyses of Family Background and School Factors by Geographic Location and Grade Level for Attitude Toward Life

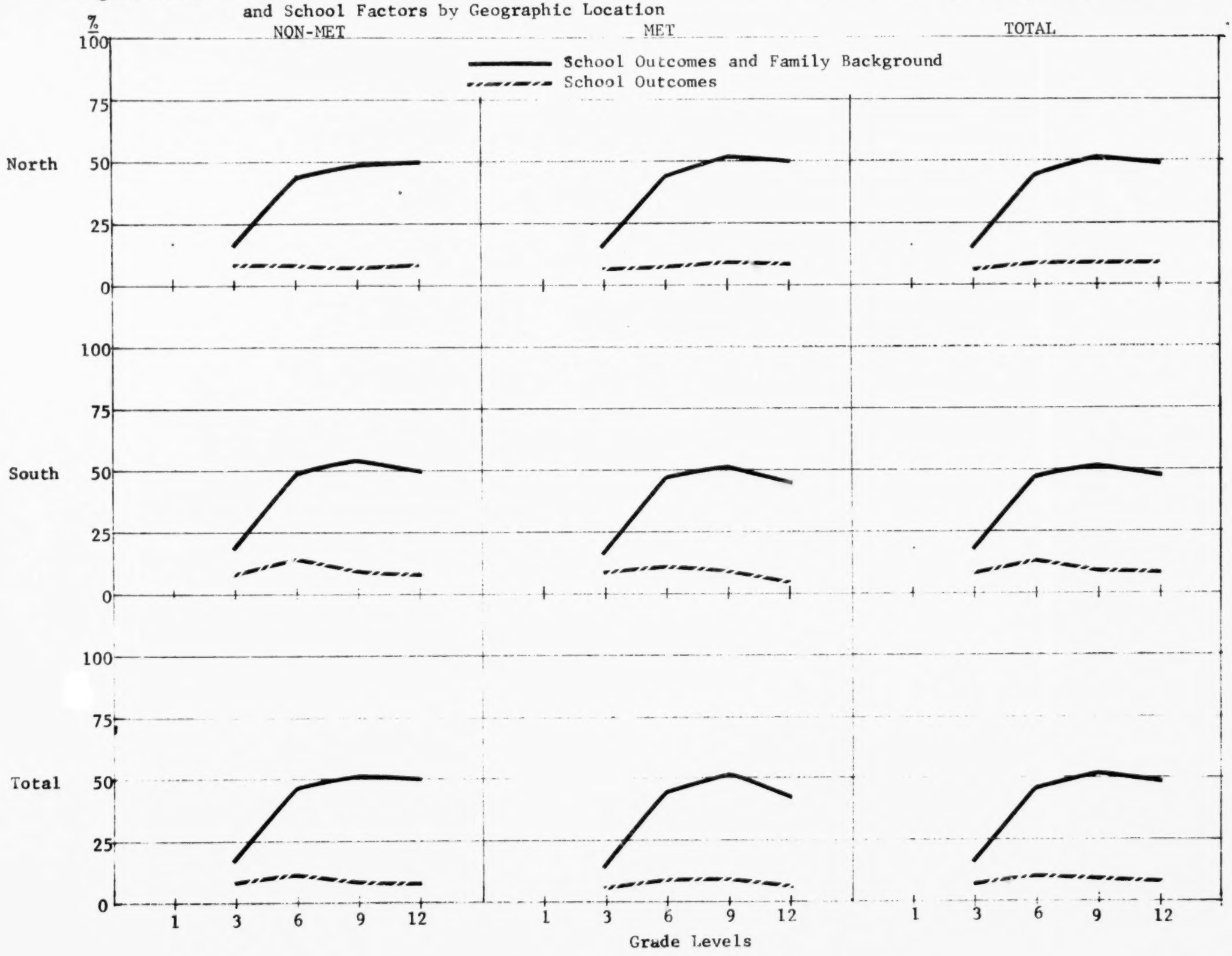


In summary, Attitude Towards Life is more predictable in the South than in the North from a set of school variables (SO) both alone and in combination with a set of family background measures (FB). The characteristic reversal at the twelfth grade which was observed in the previous chapter using only student variables was not observed when school variables (SO) were brought into the analysis. Unitized commonality analyses for the ninth grade showed that the unique role of family background (FB) was greater than that of the school (SO). This difference was more pronounced in the North than in the South, the difference sometimes being as much as 10 to 1. This difference was also slightly more pronounced in the met than in the non-met areas for both North and South. The common portions are larger in the South than in the North which suggests that there is a greater interplay of school (SO) and family background (FB) influences in the South than in the North. Results for the other grade levels showed that in the South the unique roles for FB decreased while that for SO increased. In the North, however, the unique role for FB increased and for SO decreased for non-met areas. In the met North the unique role of FB stayed about the same at the higher grade levels while that for SO increased slightly.

8.3 Variations in Family Background and School Factors for Educational Plans and Desires by Geographic Location

Figure 8.3.1 shows that for SO, Educational Plans is slightly more predictable in the South than in the North. An exception occurs at the twelfth grade when the met North becomes slightly more predictable than the met South. When FB is brought into the analysis with SO, the South

Figure 8.3.1. - Percent of Variation in Educational Plans and Desires Accounted for by Family Background and School Factors by Geographic Location



continues to be more predictable than the North except at the twelfth grade where the met North becomes more predictable.

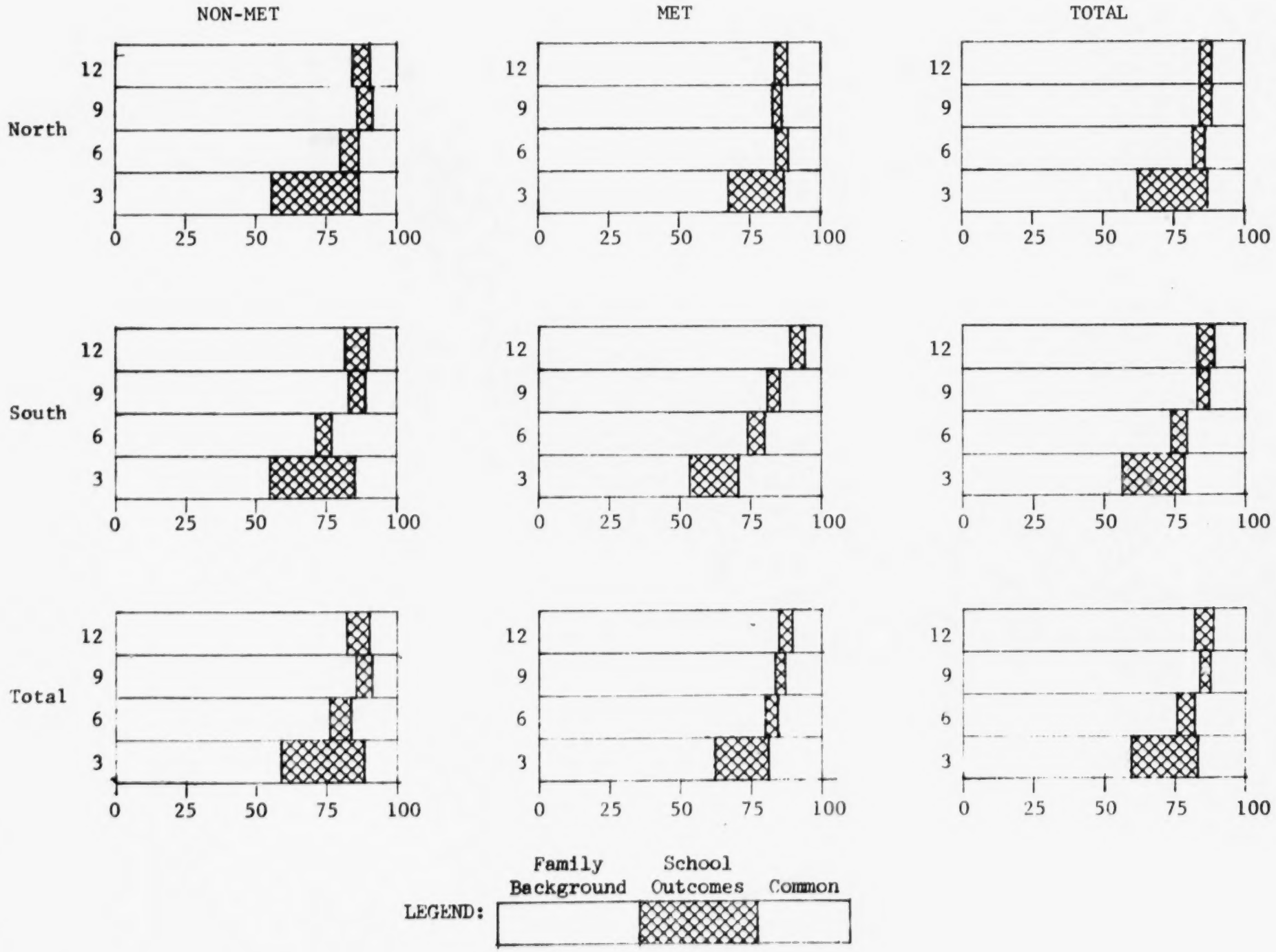
Table 8.3.1. - Unitized Commonality Analyses of Family Background and School Factors for Educational Plans by Geographic Location: Ninth Grade Students

Region	Non-Metropolitan Unique FB	Non-Metropolitan Unique SO	Non-Metropolitan Common	Metropolitan Unique FB	Metropolitan Unique SO	Metropolitan Common	Total Unique FB	Total Unique SO	Total Common
North	86	6	8	83	3	14	84	4	12
South	83	6	11	81	4	15	83	4	13
Total	85	6	9	83	4	13	83	4	13

Table 8.3.1 shows that differences among the subgroups in the unique roles of SO and FB factors tend to be relatively small. What does stand out for all groups is the enormously greater percentage role for family background (FB) than for the school (SO), with FB exceeding SO by as much as 28 to 1. The met areas do tend to have slightly larger common portions which suggests that for Educational Plans, there may be a greater interplay of FB and SO in met than in non-met areas.

Figure 8.3.2 shows that somewhat similar results prevail at the other grade levels with some exceptions. The third grade is in least agreement with the other grade levels; however, the relative roles do tend to agree with the higher grade levels since the unique value for FB is greater than for SO. The other exception is at the sixth grade in the South where the unique value for FB is somewhat lower and the common portion somewhat higher.

Figure 8.3.2. - Unitized Commonality Analyses of Family Background and School Factors by Geographic Location and Grade Level for Educational Plans and Desires



In summary, Educational Plans was found to be more predictable in the South than in the North from both SO and FB, except at the twelfth grade in the met North. Unitized commonality analyses at the ninth grade showed that the subgroup differences were rather small; slightly larger common portions were found in the met than in the non-met areas. The dramatic difference was for the unique role of SB to outweigh that of SO - sometimes by as much as 28 to 1. Somewhat similar results were observed for the other grade levels, the third grade being in least agreement with the others.

8.4. Variations in Family Background and School Factors for Study Habits by Geographic Location

Figure 8.4.1 shows the squared multiple correlations of SO and FB for Study Habits. For SO, the South is uniformly more predictable than the North, these North-South differences were slightly greater for non-met than for met areas. When FB is brought into the analysis with SO these North-South differences tend to remain except at the twelfth grade. At the twelfth grade the met North becomes more predictable while the non-met North and South become equal.

Table 8.4.1 presents unitized commonalities for Study Habits at the ninth grade.

Figure 8.4.1. - Percent of Variation in Study Habits Accounted for by Family Background and School Factors by Geographic Location

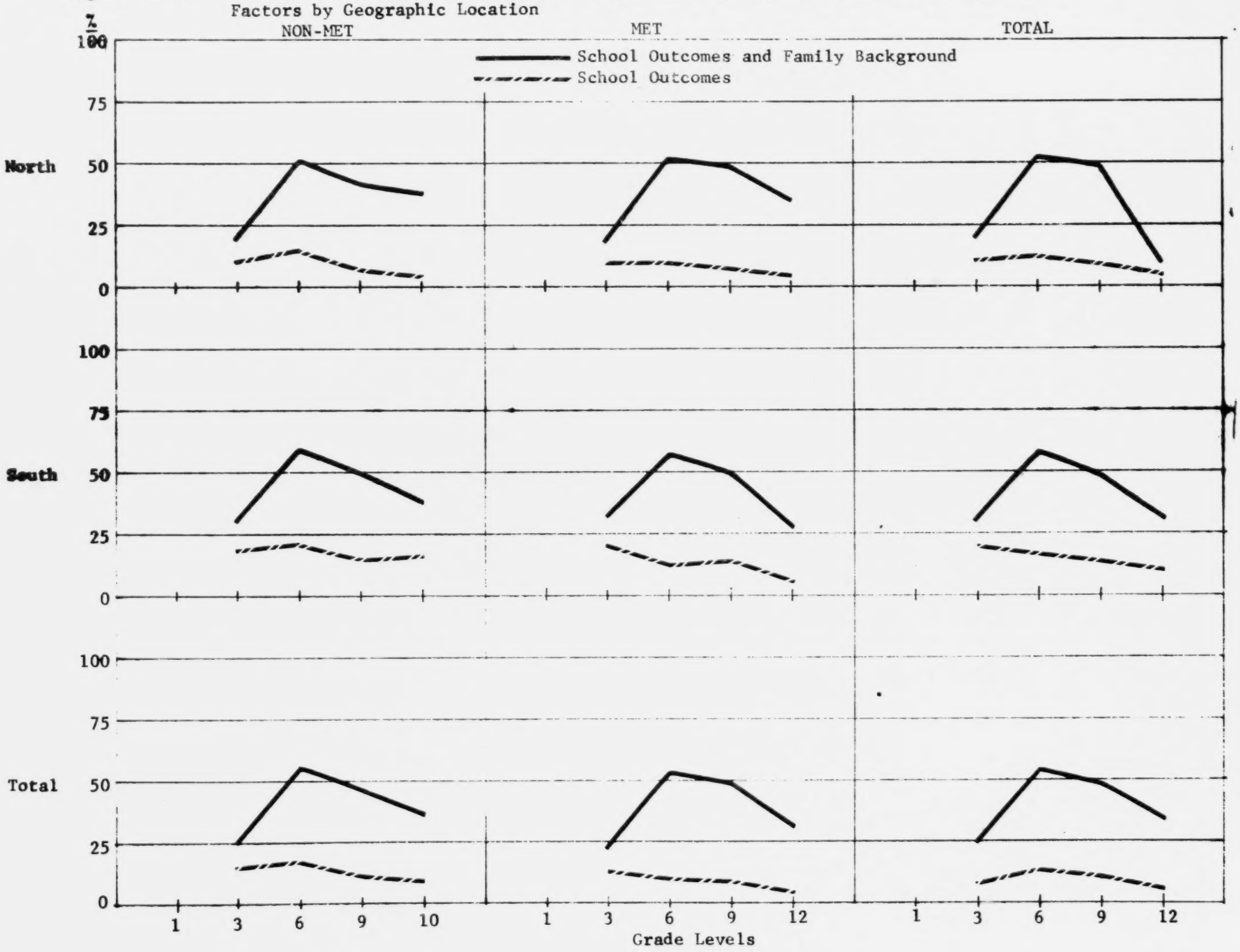


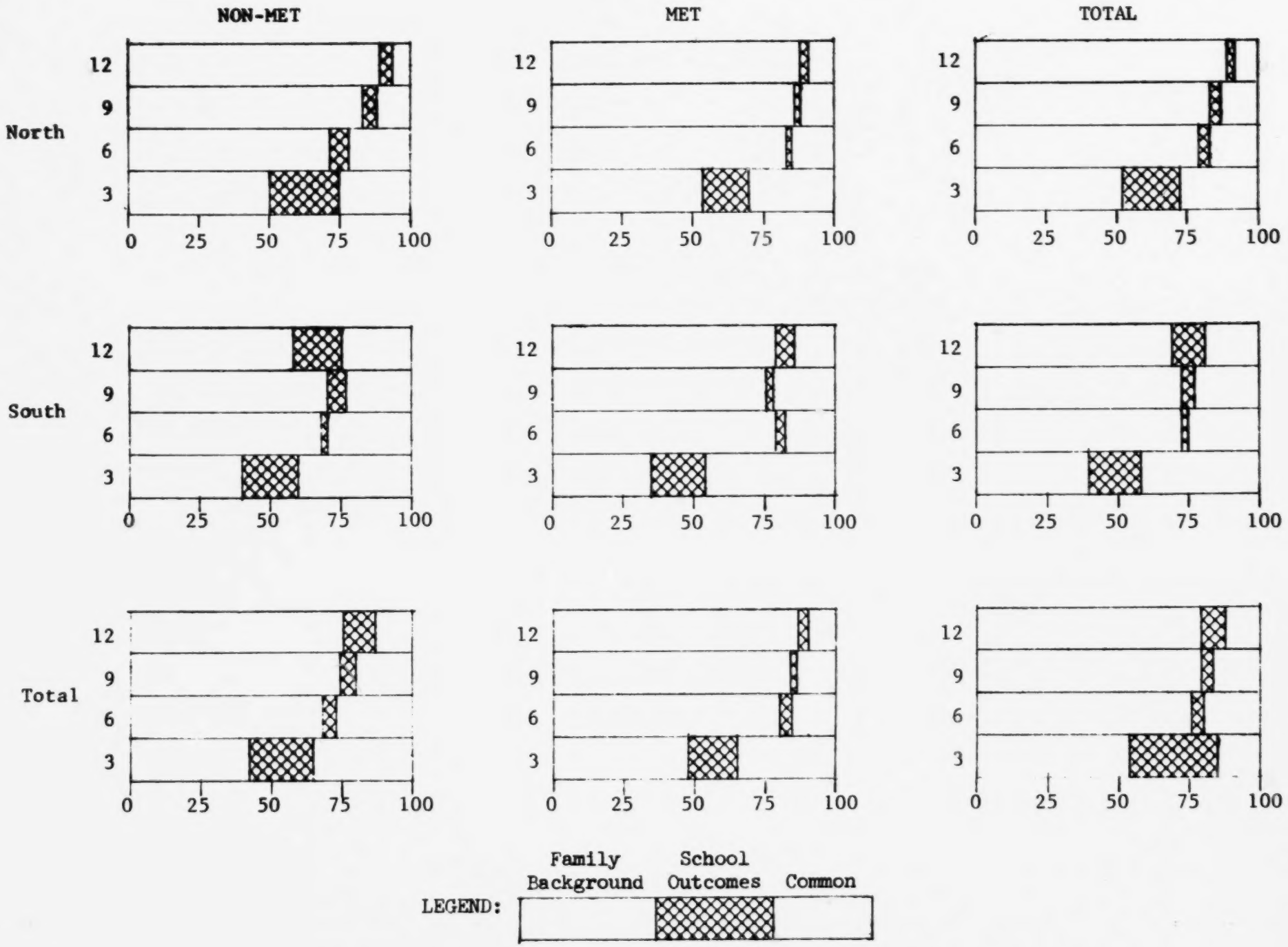
Table 8.4.1. - Unitized Commonality Analyses of Family Background and School Factors for Study Habits by Geographic Location: Ninth Grade Students

Region	Non-Metropolitan Unique FB	Unique SO	Common	Metropolitan Unique FB	Unique SO	Common	Total Unique FB	Unique SO	Common
North	83	5	12	86	2	12	83	4	13
South	71	6	23	76	2	22	73	4	23
Total	74	6	20	84	2	14	79	4	17

Inspection of Table 8.4.1 shows that the most pronounced difference in the relative roles of family background (FB) and school (SO) factors if for the North versus the South. In the North the unique role of FB is greater than in the South whereas the common portions are larger in the South than in the North. There are also met-non-met differences in the unique value for SO, which slightly greater in the non-met areas. The most dramatic difference, however, is for the unique role of FB to outweigh that of SO, sometimes by as much as 43 to 1.

Figure 8.4.2 compares these results with those at the other levels. Inspection of the figure shows that there are somewhat different grade level trends particularly for the met and non-met South. The third grade is not in close agreement with the other grade levels; the unique role of FB,however, does exceed that of SO for all groups. In the North the unique value for FB increases slightly at the higher grade levels while the common portion declines and the unique value for SO stays about the same. In the South, however, there are difinite met-non-met differences. In the non-met South the unique value for FB declines at the twelfth grade while the unique value for SO increases. In the met South, the unique values for both

Figure 8.4.2. - Unitized Commonality Analyses of Family Background and School Factors by Geographic Location and Grade Level for Study Habits



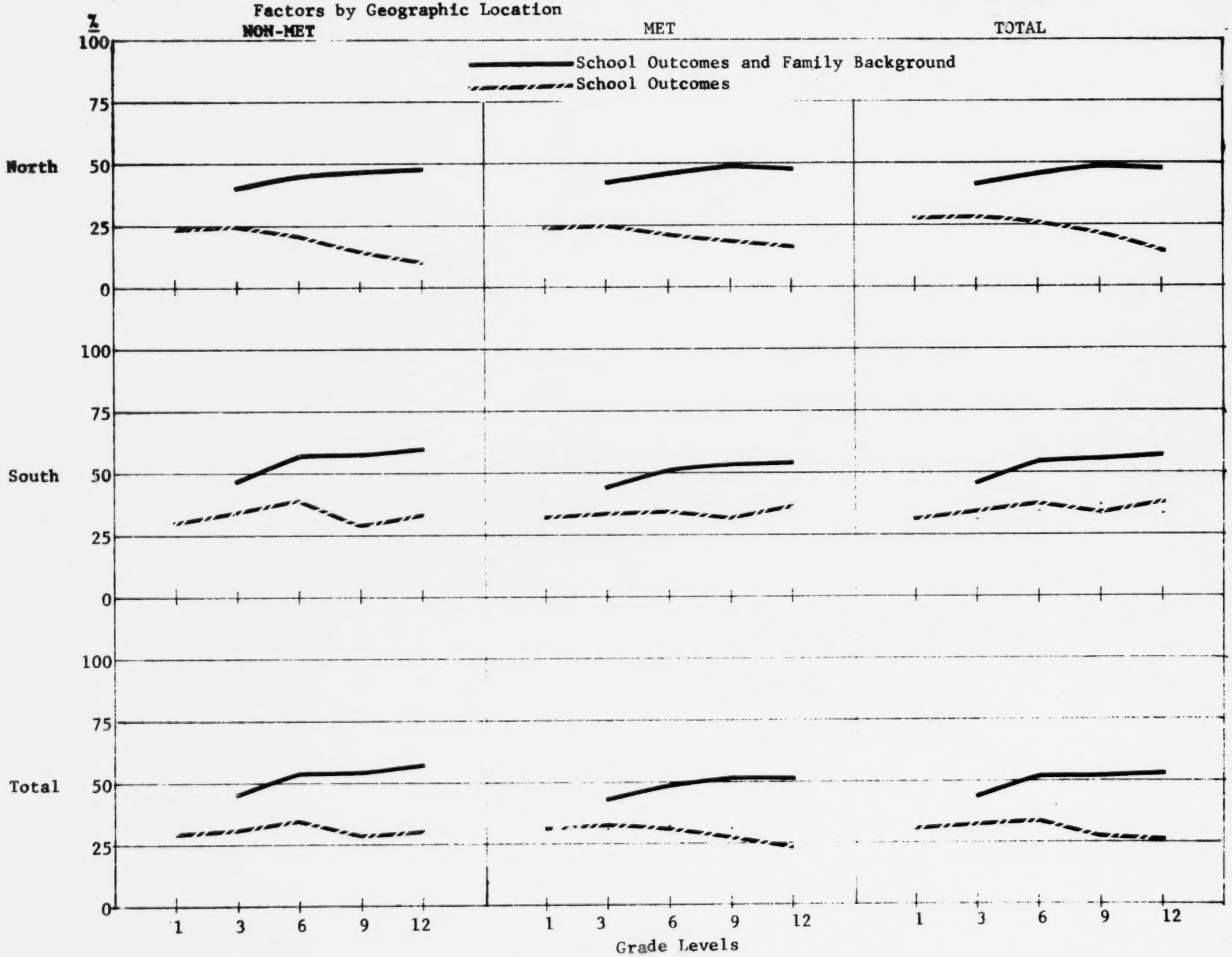
FB and SO increase and the common portion decreases. For all grade levels, however, the unique role of FB is much greater than for SO.

In summary, we have seen that Study Habits is more predictable in the South than in the North from a set of school factors (SO) both alone and in combination with a set of family background (FB) factors, except at the twelfth grade. At the twelfth grade, when both sets of factors are combined, the met North becomes more predictable than the met South while the non-met areas attain the same value. Unitized commonality analyses at the ninth grade showed that the unique role for FB was greater in the North than in the South while the unique role for SO was slightly greater in the non-met than in the met areas (both North and South). The most dramatic difference, however, was for the unique role of FB to outweigh SO by as much as 43 to 1. Results at the other grade levels showed some differences for the different groups. In the North, for both met and non-met, the unique role for FB increases slightly at the higher grade levels, while that for SO stays about the same. In the South, at the higher grade levels, the unique role for FB decreases while that for SO increases in the non-met areas. In the met South, however, the unique roles for both FB and SO increase. For all grades the most pronounced difference is for the unique role of FB to exceed that of SO.

8.5 Variations in Family Background and School Factors for Achievement by Geographic Locations

Figure 8.5.1 gives the squared multiple correlations for Achievement at the different grade levels. The mean Achievement for each school is used to represent the set of school factors (SO) at the first grade. For SO, Achievement is more predictable in the South than in the North. In

Figure 8.5.1. - Percent of Variation in Achievement Accounted for by Family Background and School Factors by Geographic Location



the North the predictability tends to decrease at the higher grade levels whereas in the South it tends to stay about the same or increase slightly. The predictability is lowest for the non-met North and greatest in the non-met South. When the set of family background factors (FB) are brought into the analysis with SO these same North-South differences remain even at the twelfth grade. The met-non-met differences in the North become less pronounced while those in the South became more pronounced when FB is brought into the analysis.

Table 8.5.1 presents unitized commonalities for the ninth grade.

Table 8.5.1. - Unitized Commonality Analyses of Family Background and School Factors for Achievement by Geographic Location: Ninth Grade Students

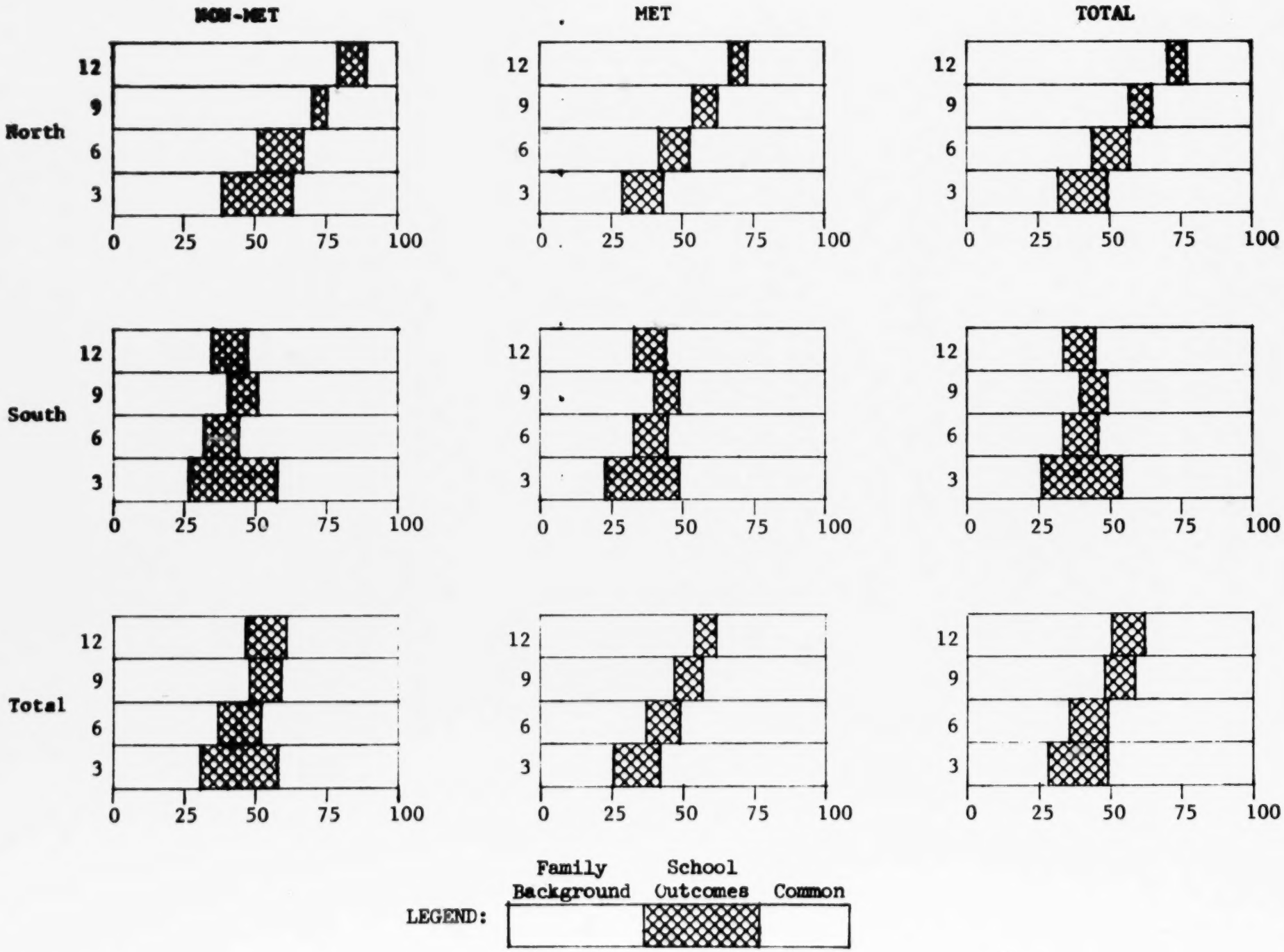
	Non-Metropolitan			Metropolitan			Total		
	Unique		Common	Unique		Common	Unique		Common
Region	FB	SO		FB	SO		FB	SO	
North	70	6	24	54	8	38	57	8	35
South	41	10	49	40	9	51	40	9	51
Total	48	11	41	47	10	43	48	10	42

Inspection of Table 8.5.1 shows some very marked North-South as well as met-non-met differences. In the non-met North the unique role of FB is about eleven times larger than that of SO. In the met-North this figure drops to about eight times larger while in the South, for both met and non-met, the value drops to about four times larger. One should not overlook the common portions, however, for they may represent an interplay of family background (FB) and school influences (SO). The common portion is smallest in the non-met North and largest in the South.

Figure 8.5.2 compares these results with those for the other grade levels. As with the motivational and attitudinal measures in the previous sections, results at the third grade do not agree well with the other grade levels except that the unique values for FB exceed those for SO in the North and are very close together in magnitude in the South (although SO is a little larger). For the other grade levels the major differences are by North-South and some minor differences for the North met and non-met. In the non-met North the unique role of FB increases at the higher grade levels while that for SO decreases at the ninth grade to increase again at the twelfth. In the met North the unique role of FB is not as large as for non-met but it does increase at the higher grade levels. For met North the unique role of SO decreases at the higher grade levels. In the North, for both met and non-met, the common portions decrease at the higher grade levels. Quite different trends emerge for the South. In the South the common portions are much larger than in the North, the unique role of FB increases at the ninth grade to decrease again at the twelfth while the unique role of SO decreases at the ninth to increase again at the twelfth. However, for grade levels except the third, the unique value of FB is greater than that of SO.

In summary we have seen that for a set of school (SO) and family background (FB) factors, Achievement is more predictable in the South than in the North. Unitized commonality analyses at the ninth grade showed that the common portions for FB and SO tended to be large particularly in the South and that the amount by which the unique role of FB exceeded that of SO varied from 11 to 1 in the non-met North to 4 to 1 in the non-met South. Results for the other grade levels showed that in the North the unique role for FB increased at the higher grade levels while that for SO decreased

Figure 8.5.2. - Unitized Commonality Analyses of Family Background and School Factors by Geographic Location and Grade Level for Achievement



at the ninth and then continued to decrease in met areas but increased in non-met. In the South, for both met and non-met, the unique value for FB increased up to grade nine and then decreased while that for SO dropped at grade nine and then increased slightly. The common portions which might represent a mutual interplay or confounding of school and family background influences were much larger in the South than in the North. However, for all groups and grade levels except the third, the role of FB exceeded SO.

8.6 Summary and Discussion

The questions for which answers were sought in this chapter were: (1) To what extent are the differences among students in their achievement and motivation more fully explained (or more predictable) from family background and school factors in different regions of the country (North-South) and in different areas of residence (metropolitan-non-metropolitan)? and; (2) To what extent do the relative roles of family background and school factors in the development of achievement and motivation differ for these different groups?

To represent all aspects of the students family background (FB) the combined Family Social Background and Process sets of variables were used (as defined in Chapter 4). In all, this set was comprised of seven variables. Previous analyses of school factors, in Chapter 5, used a set of 39 variables to represent different aspects of the schools staff, resources and facilities as well the social background, achievement and motivational levels of the student body. For the groups under examination here this would be an excessively large number of variables to use relative to the number of schools in each group. In order to reduce this number of

variables a property of the data analysis model was exploited (see chapter 2). As discussed in previous chapters (2, 5 and 6),this model yields one school variable which is maximally correlated with the individual student dependent variable. That variable is the school mean counterpart of the dependent variable (e.g.,school Achievement when individual student Achievement is the dependent variable). In chapter 5, the school mean counterpart of each dependent variable was contained in a set of 5 variables called School Outcomes (SO). It was demonstrated empirically that the use of this set of 5 variables (a subset of the full 39) would not bias the results in favor of one or the other of family background and school influences. Accordingly, the SO set was used to represent possible school influences.

To obtain an answer to the first question concerned with group differences in the extent to which achievement and motivation can be explained, a statistical test of the equality of slopes and intercepts was used for the FB and SO sets combined. This test indicated that for all the groups (North non-metropolitan, North metropolitan, South non-metropolitan, South metropolitan) at almost all of the grade levels (except the third) the slopes were different for statistical as well as practical purposes. To obtain an answer to the second question concerned with differences in the relative roles of FB and SO, commonality analyses (as developed in Chapter 2) were conducted and compared for the different groups. In order to make the analyses for the different groups more comparable a "unitizing" operation was performed (by dividing the common and unique portions by the squared multiple correlation obtained for FB and SO combined). This "unitizing" operation makes the common and unique portions sum to 100 percent. This common percent will receive some attention in the following summary since it represents a confounding as well as a possible interplay for FB and SO.

The following summary is organized around each dependent variable. The sets of regressor variables (those against which the dependent variable is regressed) are the FB and SO sets as defined above. Results at the first grade were not included in these analyses since a full FB set was not available at that grade level. An interpretation of each dependent variable has been given elsewhere (see Chapter 2). Major emphasis is given to the results at grade nine and then the other grade level results are compared against these. Grade nine is emphasized because the results are best measured at grades nine and twelve, however, most of the dropouts have not yet occurred at grade nine. Metropolitan and non-metropolitan are abbreviated to met and non-met, respectively.

Expectations for Excellence

Expectations was found to be more fully explained (or more predictable) in the South than in the North from SO alone and in combination with FB, except at the twelfth grade. At the twelfth grade the North becomes more predictable than the South. Unitized commonality analyses at the ninth grade resulted in the following values uniquely attributable to FB, SO and their common percent

	Non-Metropolitan Unique			Metropolitan Unique		
	FB	SO	Common	FB	SO	Common
North	87	5	8	89	2	9
South	82	4	14	85	4	11

Although the differences among these groups are not large there is some tendency for FB to be larger in the North and for SO to be smaller in the met North. The larger common percents in the South, particularly non-met South suggests a greater interplay of FB and SO. The most dramatic difference, however, is for FB to outweigh SO, sometimes by as much as 22 to 1. Results at the other grade levels showed that the role of FB increased at the higher grade levels, particularly in the North, while the role of SO decreased through the ninth grade to increase again at the twelfth, particularly in the South. For all grade levels, however, (except the third grade, non-met North) the role of FB was much larger than that of SO.

Attitude Towards Life

It was found that Attitude Towards Life could be more fully explained in the South than in the North for SO both alone and in combination with FB. Unitized commonality analyses at the ninth grade yielded the following percentages:

	Non-Metropolitan Unique			Metropolitan Unique		
	FB	SO	Common	FB	SO	Common
North	73	11	16	69	7	24
South	53	14	33	58	13	29

These results show that the role of FB is much greater in the North than in the South, particularly the non-met North. The role of SO is somewhat larger in the South than in the North. The common portions, which may represent a mutual interplay of FB and SO, are larger in the South especially the non-met South. The most dramatic difference however, is

for the role of FB to outweigh that of SO by as much as 10 to 1 (in the met North). Results for the other grade levels showed that, in the South, the role of FB decreased and that of SO increased at the higher grades. In the non-met North, however the role of FB increased at the higher grade levels while that for SO decreased. In the met North the role of FB stayed about the same while that for SO increased slightly. For all the grade levels (except the third grade, non-met North), the role of FB is usually much larger than that of SO.

Educational Plans and Desires

Educational Plans and Desires was found to be more predictable in the South than in the North from SO both alone and in combination with FB except at the twelfth grade in the met North. Unitized commonality analyses at the ninth grade yielded the following:

	Non-Metropolitan			Metropolitan		
	Unique			Unique		
	FB	SO	Common	FB	SO	Common
North	86	6	8	83	3	14
South	83	6	11	81	4	15

These group differences are rather small there being slightly larger common portions in the met than in the non-met areas and slightly larger roles for FB and SO in the non-met areas. The dramatic difference is for the role of FB to outweigh that of SO, by as much as 28 to 1 in the met North. Somewhat similar results were observed for the other grade levels, the third grade being in least agreement with the others.

Study Habits

Study Habits was found to be more fully explained in the South than in the North from SO, both alone and in combination with FB, except at the twelfth grade. At the twelfth grade for FB and SO combined the met North becomes more predictable than the met South while the non-met areas attain the same value. Unitized commonality analyses at the ninth grade yielded the following values:

	Non-Metropolitan Unique			Metropolitan Unique		
	FB	SO	Common	FB	SO	Common
North	83	5	12	86	2	12
South	71	6	23	76	2	12

These results show that the role of FB is much larger in the North than in the South while the role of SO is larger in the non-met than the met areas. The most marked difference, however, is for the role of FB to outweigh SO, by as much as 43 to 1 in the met North. Results for the other grade levels showed some differences for the different groups. In the North for both met and non-met, the role of FB increases slightly while that of SO stays about the same. In the non-met South the role of FB decreases and SO increases while in the met South both FB and SO increase. For all grades, however, the most pronounced trend is for FB to exceed SO.

Achievement

From SO alone and when combined with FB, Achievement was found to be more fully explained in the South than in the North. Unitized commonality analyses at the ninth grade showed the following:

	Non-Metropolitan Unique			Metropolitan Unique		
	FB	SO	Common	FB	SO	Common
North	70	6	24	54	8	38
South	41	10	49	40	9	51

These results show that the common portions, which might to some extent, represent a mutual interplay of FB and SO, tend to be larger for Achievement than for the attitudinal and motivational variables, particularly in the South. The role of FB is much greater than that of SO in the non-met North, being on the order of about 11 to 1. This difference drops to about 4 to 1 in the South (both met and non-met). Results for the other grade levels showed that in the North the role for FB increased at the higher grade levels while that for SO decreased in met areas but increased at the twelfth in non-met. In the South, for both met and non-met, the value for FB increased through grade nine and then decreased while that for SO dropped at grade nine and then increased again. For all grade levels the common portions were much larger in the South than in the North. For all groups and grade levels (except the third) FB exceeded SO.

Analyses in this chapter have shown that Expectations, Educational Plans and Study Habits are more fully explained by a set of Family Background (FB) and School Factors (SO) in the South than in the North except at the twelfth grade. At the twelfth grade the North becomes more predictable than the South. For Attitude Towards Life and for Achievement the South is more predictable than the North from FB and SO for all grade levels. Many of the differences that occur from the ninth to the twelfth grade have been attributed to the loss of the less well motivated, lower achieving dropouts. The fact that changes did not occur for Attitude Towards Life and Achievement suggests that the forces that are influential at the ninth grade are still operative at the twelfth grade. In addition, it is suggested that, since a reversal in the predictability of South and

North did occur at the twelfth grade from FB only (see the previous chapter) and then was reversed again when SO was brought into the analysis with FB, the school is playing some kind of an influencing role.

For all of the dependent variables the role of FB exceeds that of SO, sometimes quite dramatically. This means that family background (FB) plays a much greater role than the school (SO) in the development of achievement and motivation. Part of this is due to the result as explained in Chapter 5, that individual students and their families differ more than do schools and therefore may have a larger relationship with other individual student variables than would differences among schools. This role of FB is usually much greater in the North than in the South for all the dependent variables except Educational Plans. For Educational Plans these differences are greater for the met than for the non-met (both North and South).

The common portions (which may represent a mutual interplay of family background (FB) and school influences (SO)) are always greater in the South than in the North and range in size from small (8 to 15) for Expectations and Educational Plans through medium (16 to 33) for Study Habits and Attitude Towards Life, to large (34 through 51) for Achievement. If these common portions do represent a mutual interplay, then the extent of this involvement is much greater for Achievement than for the other variables.

The role of school influences (SO) although never large, is usually greater in the South than in the North. These results taken together with the observations that the predictability and the common portions tended to be larger in the South and the role of family background (FB) tended to be smaller suggest that we are observing differences within each region in

the social organization of schools that are related to their influence. What we have demonstrated is that independently of an individual students own family background (FB), the achievement and motivational levels of the students he goes to school with have an influence on his achievement and motivation. In the South where there are greater disparities among schools in the composition of their students achievement and motivational levels, the schools have a greater influence than they do in the North where the schools are more homogeneous in this regard. The problem does not end there, however, for we saw in Chapter 5 that differences among schools in the achievement and motivational levels of their students are moderately to highly correlated with the Social Background of the student body as well as with the comprehensive set of 31 school variables (SCHL in Chapter 5) representing different aspects of the school's resources, staff and policies. That this is the manifestation of a deep seated social problem is indicated not only by these moderate to large correlations of school influences (SO) with the Student Body's Social Background (their Socio-Economic, Family Structure and Racial-Ethnic Composition) but also by the kinds of variables in the School (SCHL) set that are related to School Outcomes (SO). As indicated elsewhere these are such variables as the racial composition of the teaching staff, their verbal skills, etc., (see Mayeske, et.al., 1969).

These analyses also suggest that to equalize schools with regard to the kinds of variables in the School (SCHL) set (by raising the levels of the lower ranking schools) may produce some desirable results but would not alter much the influence of the achievement and motivational levels of one's fellow students. This is so because students of similar achievement and motivational levels would still be attending school with

one another. To alter the achievement and motivational composition of the schools (and thereby their social composition too, since they are moderately to highly correlated) a variety of avenues are open to trial including relocation of school boundaries, bussing, open housing, etc. Even these moves may not be enough. Previous analyses have shown for schools that start out on an equal basis in terms of the achievement levels of their students, after about five years those schools with a greater proportion of high Social Background students (i.e. those from the higher socio-economic strata, who have both parents in the home and happen to be white or Oriental) show greater gain in achievement than schools with a greater proportion of students of lower Social Background (see Mayeske, et.al., 1969, Chapter 8). Somewhat similar results have been found for the same students observed at different points in time,viz., students with a higher socio-economic background show more growth in curriculum-related subjects than students with a lower socio-economic background (Shaycoft, 1967). It would seem then that a concerted attempt to improve student achievement and motivation would operate not only to alter the schools but would also operate to improve the social well being of families (e.g. by employment and income supplements) and their involvement in educationally related child rearing activities.

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